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The genus *Ernodea* Swartz : a study of species and races*

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This genus of Rubiaceae was established by Swartz † on a single species, *E. littoralis* Sw., from the island of Jamaica. It has recently been regarded as monotypic, consisting only of the type species, which is widely distributed in the Caribbean region, in Jamaica, Florida, the Bahamas, and from Santo Domingo to Guadeloupe. I do not find the genus reported from Cuba, though it almost certainly exists there and further exploration will probably reveal it. Attempts have been made to refer to *Ernodea* plants now relegated to the genus *Putoria* of the Old World and to *Isidorea* of the West Indies.

In 1905 Dr. Small characterized *Ernodea angusta* ‡ from pine-lands in southern Florida, and in the same year I described *Ernodea Cokeri* § found among the collections made by Professor Coker on Abaco Island during the Bahamian exploration organized by the Geographical Society of Baltimore. The Bahamian explorations conducted by the New York Botanical Garden and the Field Museum of Natural History have revealed the existence in the Bahamas of several additional species with apparently numerous races, the genus evidently having its greatest development in these islands. These explorations have afforded convenient opportunity for field study of the plants.

The shrubs form colonies sometimes of large size, spreading from underground parts so as to clothe densely the sand or rocks on which they grow. So far as our observation goes, they are confined to limestone rocks or limestone sand. That mutation takes place freely is indicated by the fact that in the Bahamas, at least, one colony will often differ from another near by in some

* This treatment of a genus will serve to illustrate the propositions advanced by the writer in the symposium on "Aspects of the Species Question," at the meeting of the Botanical Society of America, Chicago, January, 1908.

† Prodr. 29. 1788.

‡ Bull. N. Y. Bot. Gard. 3: 438.

§ In Shattuck, The Bahama Islands, 264, Botany by W. C. Coker.

minor character, such as leaf-form, tint of the corolla, prostrate or bushy habit. That such small characters are transmittable by seed is also evidenced by plants with identical features forming colonies at some distance from each other, and too far apart to have been produced by underground connection. The small fleshy yellow fruits of these plants are probably freely distributed by birds.

The numerous specimens now in the herbarium of the New York Botanical Garden seem to me to fall into six species, composed of a considerable number of races. Characters taken as specific are indicated by the following key :

Calyx-lobes varying from nearly as long as the fruit to longer.

Leaves lanceolate to oblong, oblanceolate or oblong-lanceolate, 5-10 mm. wide.

Corolla white to pink; leaves relatively broad; plant mostly of coasts.

1. *E. littoralis*.

Corolla red to scarlet; leaves relatively narrow; plant mostly of pine-lands.

2. *E. angusta*.

Leaves narrowly linear, 1-3 mm. wide.

3. *E. Cokeri*.

Calyx-lobes much shorter than the fruit.

Leaves oblong-lanceolate, 6-8 mm. wide.

4. *E. Millspaughii*.

Leaves narrowly linear to linear-oblanceolate, 1-3 mm. wide.

Leaves bristle-tipped; calyx-lobes half as long as the fruit.

5. *E. Taylora*.

Leaves merely mucronate; calyx-lobes one third as long as the fruit.

6. *E. Nashii*.

1. ERNODEA LITTORALIS Sw. Prodr. 29. 1788

The first mention and illustration of this type species of the genus was by Sir Hans Sloane in his Natural History of Jamaica, where he denominated it "Thymelaea humilior foliis acutis atrovirentibus" and illustrated it on his plate 189, figs. 1 and 2. By Patrick Browne, in History of Jamaica 140, it was referred to *Knoxia*, an East Indian genus established by Linnaeus in 1753. Jamaica is therefore the type locality of the species. I observed this plant, in company with Mr. William Harris, in September, 1907, at two points on the southern coast of Jamaica, where it grows prostrate on limestone rocks and sand. It has narrowly oblong to oblong-lanceolate entire sharp-pointed leaves, 4-8 mm. wide, the subulate stipules about 1.5 mm. long; the linear-lanceolate calyx-lobes are here just about as long as the fruit, but they evidently vary from

somewhat shorter to somewhat longer. The distribution of this typical race is illustrated by the specimens cited as follows:

JAMAICA: Pedro Bluff (*Britton 1247; Harris 9719*); coastal rocks, near Black River (*Britton 1365*); rocky hillside, Great Goat Island (*Britton 1884*).

FLORIDA: Key West (*Blodgett*); Sarasota Keys (*Garber*); Indian River (*Curtiss 1117*); Sugar Loaf Key (*Follard, Collins, & Morris 54*); Longboat Key (*Tracy 6752, 7496*); Miami (*Small & Nash 27*); Bull Key (*Small 629*); Virginia Key (*Britton 109*); beach opposite Miami (*Small 2152*); pinelands, Miami (*Britton 462*).

BAHAMAS: Great Bahama (*Britton & Millspaugh 2373, 2707*); Abaco (*Brace 1806; E. angusta* Small?); Andros (*Brace 6770*); Harbour Island (*Mrs. Britton 6380, 6414*); Eleuthera (*Britton & Millspaugh 5410*); Crooked Island (*Brace 4606, 4624*); Long Cay (*Brace 4069*); Acklin's Island (*Brace 4282*); Rum Cay (*Brace 3943*); Green Cay (*Coker 244*); Mariguana (*P. Wilson 7456*); Great Ragged Island (*P. Wilson 7880*).

SANTO DOMINGO: (*Wright, Parry, & Brummel 220*).

PORTO RICO: Sand dunes, Santurce (*Heller 64; Millspaugh 266*); Mayagüez to Joyua (*Underwood & Griggs 185*); Island of Culebra (*Britton & Wheeler 205*).

ST. CROIX: (*Hansen 155*).

GUADELOUPE: Calcareous rocks, Desirade (*Duss 2772*).

Race 1. Leaves narrowly linear-oblong, glandular-serrulate; twigs glabrous; calyx-lobes as long as the fruit or a little longer.

BAHAMAS: Cockburn Town, Watling's Island (*Britton & Millspaugh 6075*, type; *P. Wilson 7210*).

Race 2. Leaves broadly linear-oblong, 8–10 mm. wide, glandular-serrulate; calyx-lobes a little longer than the fruit. Shrub 1.3–1.6 m. high!

BAHAMAS: Miner's Tent to Balsam Hill, Inagua (*Nash & Taylor 1274*). This is the most vigorous development of the genus that has come to my attention, and has claims for recognition as a species.

Race 3. Leaves essentially of the typical race, but glandular-serrulate; twigs densely glandular-puberulent; calyx-lobes long.

BAHAMAS: Blakesville, Inagua (*Nash & Taylor 1105*). The specimen is in flower.

Race 4. Leaves large, lanceolate or oblong-lanceolate, taper-

ing upward from below the middle, 6 cm. long, 1 cm. wide, entire-margined ; calyx-lobes a little longer than the fruit.

BAHAMAS : Swamp, road to Stopper Hill, Crooked Island (*Brace 4807*). This is the only specimen known to me to grow in swampy ground.

Race 5. Leaves relatively thin, linear-oblong, entire-margined ; calyx-lobes very narrow, 1.5 times as long as the fruit.

ST. CROIX : Pinetree Bay (*A. E. Ricksecker 333*, type).

PORTO RICO : Limestone hills three miles west of Ponce (*Heller 6243*).

There is no doubt that if plants here included in the typical race could be grown from seed, side by side, additional races to those here defined would be indicated by differences which herbarium specimens do not exhibit.

The typical race usually grows within the reach of ocean spray, accompanied by distinctively halophytic plants.

2. ERNODEA ANGUSTA Small, Bull. N. Y. Bot.

Gard. 3: 438. 1905

This pine-barren plant of southern Florida was proposed by Dr. Small as a species distinct from *E. littoralis* on account of its smaller flowers and narrower leaves. He described the flowers as whitish ; they are pink or red, though the albino condition may, likely enough, exist. My observations do not bear out the original observation that the flowers are necessarily smaller than those of *E. littoralis*, and plants of that species sometimes bear leaves as narrow as those of Dr. Small's type specimen, while red-flowered plants existing on the northern Bahama islands, while mostly narrow-leaved, like the type, sometimes bear broader leaves. It is an interesting circumstance that plants conforming to the type in both characters occur throughout the area of *Pinus caribaea* Morelet in South Florida and the northern Bahamas, almost though not quite to the exclusion of typical *E. littoralis*, as though the pine-land condition suited *E. angusta*, considered either as a species or as a race of *E. littoralis* ; this is an ecological feature of extreme interest, especially as there are a number of other species or races which give character to these pine-lands. *E. angusta* apparently extends to the coasts where pine-lands are near by, or where

pine trees formerly grew. The following specimens have been examined :

FLORIDA : Between Cutler and Longview Camp (*Small* 870) ; below Cutler (*S. H. Richmond*) ; beach opposite Miami (*Small* 2157) ; near Silver Palm School (*Small* 2260) ; near Long Prairie (*Britton* 191) ; Boca Grande Key, Marquesas Group (*Lansing* 2276 ; *E. littoralis* ?).

BAHAMAS : New Providence (*Northrop* 102 ; *Cooper* 58 ; *Coker* 63 ; *Britton & Millspaugh* 2099) ; Andros (*Brace* 4958, 5120, 5167, 5319, 6867, 6993, 7084).

Race 1. Leaves relatively twice as wide as in the typical race ; corolla bright-scarlet. This inhabits Garden Cay at the western end of the Great Bahama Island (*Brace* 3662) ; it may be better regarded as a scarlet-flowered race of *E. littoralis*.

3. ERNODEA COKERI Britton ; Coker in Shattuck, The Bahama Islands 264. 1905

Occurring at the northern and northeastern range of the genus, this species exhibits the narrowest leaves of any, these being mostly only 1.5 mm. wide or less. So far as known it is confined to Abaco and the Great Bahama, growing in pine-lands and in scrub-lands where pines evidently formerly existed. Its flowers are apparently red or pink. I have seen the plant growing on the Great Bahama Island, but not in bloom ; its aspect and habit are very characteristic there, it forming a trailing vine, a meter long or more.

BAHAMAS : Abaco (*Coker* 564 ; *Brace* 1805, 1821) ; Great Bahama (*Britton & Millspaugh* 2370).

Race 1. Leaves twice as wide as typical, approaching in size and form those of *E. angusta*. On sand dunes, Barnett's Point, Great Bahama (*Britton & Millspaugh* 2681).

4. **Ernodea Millspaughii** sp. nov.

A shrub, 6-12 dm. high, the twigs and leaves glabrous. Leaves oblong-ob lanceolate, sharply pointed, 2-3 cm. long, 5-8 mm. wide, similar to those of *E. littoralis*, the short broad stipules cuspidate ; flowering calyx obovoid, about 3 mm. long, the triangular lobes only one fifth to one fourth as long as the ovary ; corolla white, 1 cm. long, its lobes about one half as long as the tube ; fruit nearly oval, 5 mm. long, the calyx-lobes triangular-lanceolate, 1.5-2 mm. long.

BAHAMAS: Sand dunes, Clarence Town, Long Island, March 16-19, 1907 (*Britton & Millspaugh 6249*, type); Grand Turk (*Nash & Taylor 3801*). The Grand Turk specimens differ from the type in having calyx-lobes a little longer and narrower and approach the plant of Great Ragged Island (*P. Wilson 7880*), *E. littoralis*. This might be regarded as a race of *E. littoralis* with short calyx-lobes.

5. *Ernodea Taylori* sp. nov.

Spreading, with long slender branches, glabrous. Leaves narrowly linear, stiff, 1.5-2.5 cm. long, 1.5-2 mm. wide, revolute-margined, spinulose-tipped, the stipules triangular-subulate; flowers not seen; fruit golden-yellow, oval, 5 mm. long, the calyx-lobes narrowly linear, 2 mm. long.

BAHAMAS: In white land, Tenados, Inagua, Oct. 14, 1904 (*Nash & Taylor 1024*).

The foliage resembles that of *E. Cokeri*, but the calyx is altogether different.

6. *Ernodea Nashii* sp. nov.

Prostrate, glabrous throughout, the branches 6 dm. long or more, the branchlets erect or ascending, 0.5-2 dm. high, the twigs very densely clothed with leaves. Leaves linear-oblongate, leathery in texture, 2-2.5 cm. long, 2-3 mm. wide, mucronulate; flowering calyx 4.5 mm. long, its lobes acute, 1.5 mm. long; corolla 1.5 cm. long, its lobes white within, brown without, about one third as long as the tube; fruit ovoid-oval, 5 mm. long, the persistent acute calyx-lobes 1.5 mm. long.

BAHAMAS: Little Inagua, Moujean Harbor (*Nash & Taylor 1193*, type); west end of Little Inagua (*P. Wilson 7782*).